L9 ANSWER 3 OF 14 HCAPLUS COPYRIGHT 2003 ACS
AN 2001:499838 HCAPLUS
DN 135:69749
TI Intermetallic aluminides and silicides articles, such as sputtering targets, and methods of making same with high purity and good stoichiometry
IN Shah, Ritesh P.; Morales, Diana L.; Keller, Jeffrey A.
PA Honeywell International Inc., USA
SO U.S., 11 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6258719	B1	20010710	US 1998-108610	19980701
	EP 1021265	A1	20000726	EP 1998-933058	19980701
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	TW 398020	B	20000711	TW 1998-87111029	19980708
	US 2002064949	A1	20020530	US 2000-578829	20000524
	US 6417105	B2	20020709		
	US 2002102849	A1	20020801	US 2001-46330	20011025
PRAI	US 1997-52262P	P	19970711		
	US 1998-108610	A3	19980701		
	WO 1998-US13719	W	19980701		
	US 2000-578829	A2	20000524		
	US 2001-306812P	P	20010719		

AB Described is an in situ method for producing articles of metal aluminide or silicide by reactive sintering and vacuum hot pressing powders and products, such as sputtering targets, produced.
IT **12004-78-3P**
RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(intermetallic aluminides and silicides articles, such as sputtering **targets**, and methods of making same with high purity and good stoichiometry)
RN 12004-78-3 HCAPLUS
CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	3	7429-90-5

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

3/31/03

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     FILE 'REGISTRY' ENTERED AT 15:38:30 ON 31 MAR 2003
                E AL3TI/MF
L1            1 S E3
                E AL0.75TI0.25/MF
                E AL0.75 TI0.25/MF
L2          690 S AL.TI/MF
L3          140 S AL TI/ELF
L4          789 S L2-3

     FILE 'LCA' ENTERED AT 15:40:24 ON 31 MAR 2003
L5            1 S ALUMINUM TARGET

     FILE 'REGISTRY' ENTERED AT 15:41:00 ON 31 MAR 2003

     FILE 'HCAPLUS' ENTERED AT 15:41:29 ON 31 MAR 2003
L6            8 S L1(L)TARGET

     FILE 'HCAPLUS' ENTERED AT 15:41:39 ON 31 MAR 2003
L7           23 S L1(L)SPUTTER#######
L8            6 S L7 AND SUBSTRATE
L9           14 S L6 OR L8

     FILE 'STNGUIDE' ENTERED AT 15:42:56 ON 31 MAR 2003

     FILE 'HCAPLUS' ENTERED AT 15:44:37 ON 31 MAR 2003
                E JP2000-0117990/PRN,AP
L10           1 S E3-4
L11          14 S L9 NOT L10
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L9 ANSWER 10 OF 14 HCAPLUS COPYRIGHT 2003 ACS
AN 1997:632950 HCAPLUS
DN 127:324732
TI Intermetallic compound dispersion type sintered Al alloy sputtering target.
IN Fukui, Soichi
PA Mitsubishi Materials Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 09249966	A2	19970922	JP 1996-56162	19960313
PRAI JP 1996-56162		19960313		

AB In an Al-alloy sintered sputtering target contg. an Al intermetallic compd. with Ta, Zr, Ti, Hf, Nb, Cr, W, and/or Mo, the intermetallic compd. concn. decreases gradually from the target surface to its back to obtain films with a uniform compn. The target is useful for forming a reflection film in an optical media or a wiring of a liq.-crystal TFT.

IT **12004-78-3**
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(intermetallic compd. dispersion type sintered Al alloy sputtering **target**)
RN 12004-78-3 HCAPLUS
CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	3	7429-90-5

L9 ANSWER 12 OF 14 HCAPLUS COPYRIGHT 2003 ACS
AN 1996:741165 HCAPLUS
DN 126:53364
TI Void-free metalization by controlling sputtering conditions of TiN barrier metal films
AU Yamaoka, T.; Yamauchi, T.
CS Production Eng. R&D Dep., Nippondenso Co. Ltd., Aichi, 448, Japan
SO Materials Research Society Symposium Proceedings (1996), 428(Materials Reliability in Microelectronics VI), 487-492
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
AB A new technol. for realization of highly reliable 'void-free' metalization is proposed. Void formation is suppressed when the TiAl3 intermediate layer is formed at the interface between the Al alloy and reactively sputtered TiN barrier metal films. The authors have studied the relation between void formation and coverage of the intermediate layer. A coverage of >60% TiAl3 perfectly suppresses void formation. The interfacial reaction is achieved by using 'soft TiN', which arises from the short migration length of the sputtered particles impinging on the **substrate** surface when d.c. power is decreased. The soft TiN film includes many vacancies and crystallog. disordered regions which easily cause rearrangement of the TiN films by movement of Ti atoms during annealing. Probably these Ti atoms compensate vacancies in the Al-Si-Cu films and suppress the formation of Al voids.
IT **12004-78-3P**
RL: PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(void-free metalization by controlling **sputtering** conditions of TiN barrier metal films to form TiAl3 during annealing on aluminum alloy interconnects)
RN 12004-78-3 HCAPLUS
CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	3	7429-90-5

L9 ANSWER 11 OF 14 HCAPLUS COPYRIGHT 2003 ACS
AN 1997:265472 HCAPLUS
DN 126:285755
TI Sputtering targets and its manufacture
IN Masuda, Kaoru; Hiraki, Akitoshi; Taniguchi, Shigeru
PA Hitachi Metals Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09059770	A2	19970304	JP 1995-214671	19950823
PRAI	JP 1995-214671		19950823		

AB The title process comprises formation of a Ti film on the target or the backing plate and an Al film on the other, and bonding of the target to the backing plate by diffusion of Al and Ti under press heating. The target has a high bonding strength.

IT **12004-78-3P**, Aluminum titanium (Al3Ti)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(for diffusion bonding of sputtering **targets** to backing plates from aluminum and titanium films on bonding surfaces)
RN 12004-78-3 HCAPLUS
CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	3	7429-90-5

L9 ANSWER 13 OF 14 HCAPLUS COPYRIGHT 2003 ACS
AN 1996:59066 HCAPLUS
DN 124:123668
TI Protection of aluminum by duplex coatings
AU Musil, J.; Vlcek, J.; Jezek, V.; Benda, M.
CS Institute of Physics, Academy of Sciences of the Czech Republic, Na Slovance 2, Prague, 18040/8, Czech.
SO Surface and Coatings Technology (1995), 76-77(1-3, Pt. 1), 341-7
CODEN: SCTEEJ; ISSN: 0257-8972
PB Elsevier
DT Journal
LA English
AB The paper reports on a new way of producing duplex coatings consisting of two steps. First, the **substrate** is coated by a phys. vapor-deposited coating. Then, this precoated **substrate** is plasma nitrided or vacuum heat treated. This method was tested in the protection of **substrates** made of aluminum with a sputtered Ti coating about 5.mu.m thick. The as-deposited and then plasma-nitrided or vacuum-heat-treated (Ti coating)/(Al **substrate**) couple was characterized by elemental depth profiles measured by glow discharge optical spectroscopy. It was shown that both the plasma nitriding and vacuum heat treatment process can stimulate a strong interdiffusion between Ti and the **substrate** elements. It results not only in the formation of a very broad interfacial region with a dramatic redistribution of the **substrate** elements in the Ti film but also in a formation of intermetallic Ti-Al compds. This new duplex coating technique is described in detail.
IT **12004-78-3**
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(formation in plasma nitriding or vacuum heat treatment of aluminum **sputter**-coated with titanium)
RN 12004-78-3 HCAPLUS
CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	3	7429-90-5

L9 ANSWER 14 OF 14 HCAPLUS COPYRIGHT 2003 ACS
AN 1995:210126 HCAPLUS
DN 122:14735
TI Synthesis of Ti aluminides from Ti/Al laminated films by magnetron sputtering
AU Umehara, Hiroyuki; Suzuki, Takakazu; Hayashi, Ryuichi
CS National Inst. Materials Chem. Res., Tsukuba, Japan
SO Nippon Kinzoku Gakkaishi (1994), 58(9), 1050-4
CODEN: NIKGAV; ISSN: 0021-4876
PB Nippon Kinzoku Gakkai
DT Journal
LA Japanese
AB Titanium aluminides tend to have very attractive properties of low d. and excellent oxidn. resistance at .apprx.1000 K, but suffer from lack of adequate creep strength and, in most cases, from inadequate ductility and toughness. The intermetallic matrix composites reinforced with heat resistive fibers are expected to improve the ductility and toughness of intermetallic compds. Vapor phase processings are hopeful methods for near-net-shaped and continuous fiber reinforced composites or lamellar matrix composites. The synthesis of TiAl from laminated Ti/Al films by a radio-frequency magnetron sputtering method was studied. The Ti-Al synthesized films were evaluated by Auger electron spectroscopy, X-ray diffraction anal. and DTA. The Ti-Al phases to be synthesized depend on the at. ratios of Ti and Al, temps. of a **substrate** and of subsequent heat treatment. It is clarified that TiAl3, Ti3Al, and TiAl are synthesized resp. from Ti/Al laminated films at temps. of 773, 873, and 973 K, resp.
IT **12004-78-3P**
RL: PNU (Preparation, unclassified); PREP (Preparation)
(magnetron **sputtered** Ti/Al films laminate in synthesis of)
RN 12004-78-3 HCAPLUS
CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	3	7429-90-5

L9 ANSWER 9 OF 14 HCAPLUS COPYRIGHT 2003 ACS
AN 1999:64477 HCAPLUS
DN 130:118371
TI Hot-pressed and sintered sputtering target assemblies and their preparation
IN Kardokus, Janine K.; Morales, Diana
PA Johnson Matthey Electronics, Inc., USA
SO U.S., 5 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 5863398	A	19990126	US 1996-729505	19961011
PRAI US 1996-729505		19961011		

AB A sputtering target assembly is formed of hot-pressed and sintered metal powder diffusion bonded together and to a backing plate using an intermediate adhesion layer of Ti or Ti alloy.

IT **12004-78-3**
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(prepn. of hot-pressed and sintered sputtering **target** assemblies contg.)
RN 12004-78-3 HCAPLUS
CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	3	7429-90-5

L9 ANSWER 8 OF 14 HCAPLUS COPYRIGHT 2003 ACS
AN 1999:278230 HCAPLUS
DN 131:21551
TI A perspective of magnetron sputtering in surface engineering
AU Musil, J.; Vlcek, J.
CS Institute of Physics, Academy of Sciences of the Czech Republic, Prague, 180 40, Czech Rep.
SO Surface and Coatings Technology (1999), 112(1-3), 162-169
CODEN: SCTEEJ; ISSN: 0257-8972
PB Elsevier Science S.A.
DT Journal
LA English
AB Magnetron sputtering is a very powerful process which is now currently and successfully used in many applications, particularly in microelectronics and surface engineering, for the prodn. of films and coatings. Magnetron technol. is, however, continuously developing because new advanced films with prescribed phys. and functional properties are needed. This paper reports on duplex coatings, nanocomposite coatings, high-rate magnetron sputtering, and self-sputtering, i.e. new advances in magnetron sputtering technol. which are of great importance for the future development of surface engineering. A great deal of attention is devoted to (i) the coating/**substrate** interface, (ii) the magnetron sputtering of nanostructured coatings with new properties due to small grains of about 10 nm and smaller and (iii) the replacement of ecol. damaging galvanic coating processes by high-rate magnetron sputtering and self-sputtering.
IT **12004-78-3**
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)
(reaction product; interfacial reactions of **sputter**-coated titanium on aluminum)
RN 12004-78-3 HCAPLUS
CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	3	7429-90-5

L9 ANSWER 7 OF 14 HCAPLUS COPYRIGHT 2003 ACS
AN 1999:690025 HCAPLUS
DN 132:25489
TI Impact welding of aluminum to titanium - effect of thickness of target on joining interface
AU Date, Hidefumi; Sarro, Takashi; Suzuki, Toshio
CS Dept. of Mech. Eng., Tohoku-Gakuin University, Chuo, Tagajo, 985-8537, Japan
SO Zairyo (1999), 48(9), 1072-1077
CODEN: ZARYAQ; ISSN: 0514-5163
PB Nippon Zairyo Gakkai
DT Journal
LA Japanese
AB An Al projectile was impact-welded on a Ti target using a N2 gas gun at impact velocities of 200 m/s or more. Effect of thickness of the target on the compd. layer at the joint interface was examd. regarding some points. The bonding area was estd. using scanning acoustic tomog. The microstructures and element distribution in the joint were analyzed using SEM and energy dispersive X-ray spectroscopy. The bonded area did not depend on the thickness of the target, but increased with the impact velocity. The increase in the thickness of the target caused a decrease in the max. thickness of the compd. layer formed at the joint interface because of the increase in deformed vol. However, the concn. of the elements in the compd. layer varied very little with the impact velocity, thickness of the target and position in the layer.
IT **12004-78-3**
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)
(interface contg.; effect of thickness of **target** on joining interface structure in impact welding of aluminum projectiles to titanium)
RN 12004-78-3 HCAPLUS
CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	3	7429-90-5

L9 ANSWER 6 OF 14 HCAPLUS COPYRIGHT 2003 ACS
AN 2000:201059 HCAPLUS
DN 132:225908
TI Manufacture of high-density intermetallic sputtering targets from powder blends by controlled hot pressing
IN Lo, Chi-fung; Draper, Darryl; Hoo, Hung-lee; Gilman, Paul S.
PA Sony Corp., Japan; Materials Research Corporation
SO U.S., 5 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6042777	A	20000328	US 1999-366453	19990803
	DE 10035719	A1	20010215	DE 2000-10035719	20000721
	FR 2798395	A1	20010316	FR 2000-10209	20000802
	JP 2001073128	A2	20010321	JP 2000-233926	20000802
PRAI	US 1999-366453	A	19990803		

AB The blend of .gtoreq.2 metal powders for an intermetallic compd. is fabricated into a sputtering target by: (a) heating in a die to the temp. 100-400.degree. below the m.p. of the lower-melting powder, and holding to form the intermetallic compd. by diffusion alloying; (b) heating to the temp. 50-300.degree. below the m.p. of the intermetallic compd.; and (c) applying pressure for densification of the powd. intermetallic compd., esp. to >90% of theor. d. The typical blend is based on the metal powders having av. particle size <100 .mu.m, and is typically binary (esp. Ti-Al or Ni-Al) or ternary (esp. Al-Ni-Ti). The hot-pressing treatment is typically applied on the reacted powder mixt. for .gtoreq.1 h at 0.5-10 kpsi under inert atm. The hot-pressed sputtering targets are manufd. without intermediate sintering and crushing, and are suitable for phys.-vapor deposition of uniform intermetallic films on semiconductor devices. The ternary powder mixt. of Al, Ni, and Ti (with the m.p. of 660, 1455, and 1666.degree. resp.) was heated in a die to 260-560.degree. and held for 1-8 h to form the binary intermetallic compds. AlNi3, AlTi, and NiTi having the m.p. in the 1310-1385.degree. range, followed by heating to 1010-1260.degree. and pressing for .gtoreq.1 h to increase the d. of powder pack.

IT **12004-78-3**
RL: TEM (Technical or engineered material use); USES (Uses)
(sputtering with, sintered **target** for; intermetallic-compd. sputtering **targets** manufd. from powder blends by hot pressing)
RN 12004-78-3 HCAPLUS
CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	3	7429-90-5

L9 ANSWER 5 OF 14 HCAPLUS COPYRIGHT 2003 ACS
AN 2000:835296 HCAPLUS
DN 134:20296
TI Titanium-aluminum alloy sputtering target and its production method.
IN Iwamura, Eiji
PA Kobe Steel, Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2000328242	A2	20001128	JP 1999-144761	19990525
PRAI JP 1999-144761		19990525		

AB The invention provides a titanium-aluminum alloy sputtering target, suitable for use for forming a thin-film, e.g. a TiAlN film, in fabrication of an electronic device, e.g. LSI and FeRAM, wherein the titanium-aluminum alloy sputtering target contains Ti3Al intermetallic compd. of .gtoreq. 30 %, and defect, having diam. of .gtoreq. 0.1 mm, of .ltoreq. 10/100 cm2.

IT **12004-78-3**
RL: TEM (Technical or engineered material use); USES (Uses)
(titanium-aluminum alloy sputtering **target** contg. specified area of Ti3Al intermetallic compd.)
RN 12004-78-3 HCAPLUS
CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	3	7429-90-5